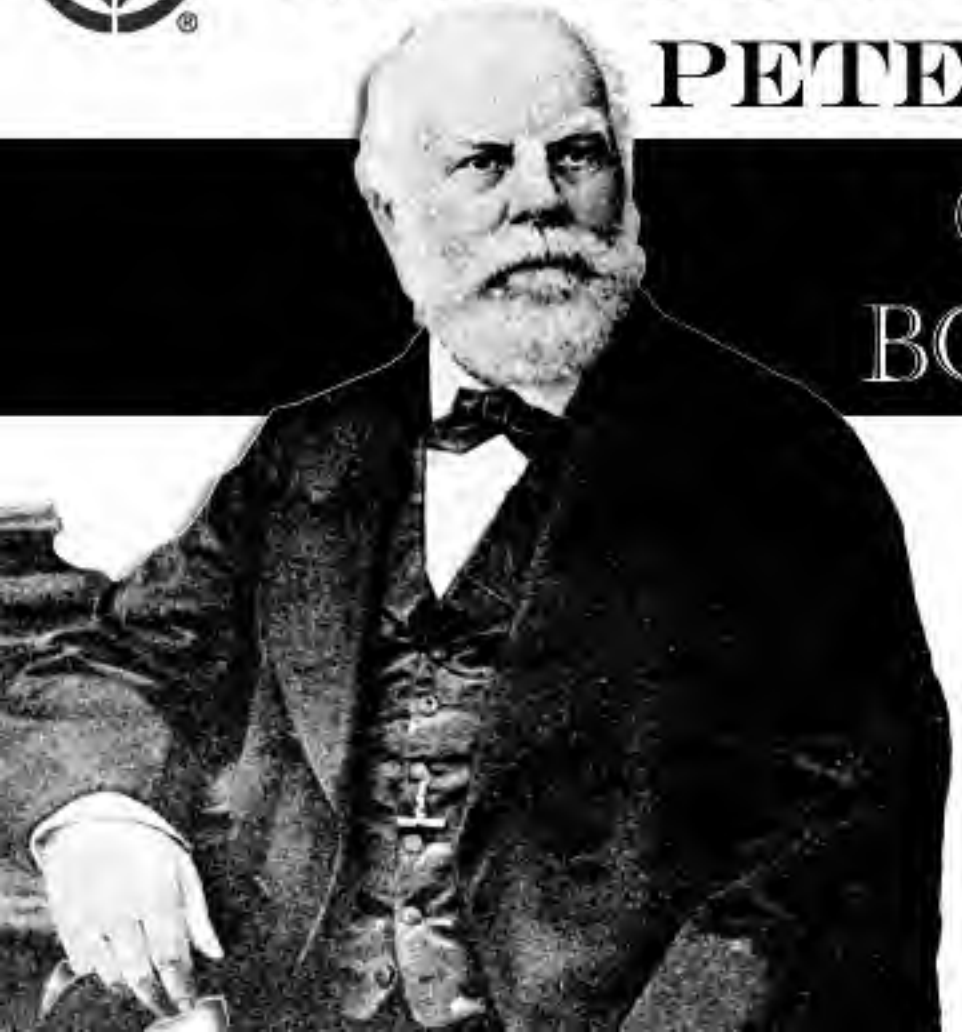
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Plantae Wrightianae

by

A. Gray

from Wright's Report

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BOTANICAL APPENDIX.

Dr. Wislizenus has intrusted to me his very interesting botanical collections, with the desire that I should describe the numerous novelties included in them. Gladly would I have done so, had not leisure been wanting, and were I not here (in St. Louis) cut off from large collections and libraries. As it is, I can only give a general view of the flora of the regions traversed, and describe a few of the most interesting new plants collected; with the apprehension, however, that some of them may have been published already from other sources, without my being aware of it.

In examining the collections of Dr. Wislizenus, I have been materially aided by having it in my power to compare the plants which Dr. Josiah Gregg, the author of that interesting work "the Commerce of the Prairies," has gathered between Chihuahua and the mouth of the Rio Grande, but particularly about Monterey and Saltillo, and a share of which, with great liberality, he has communicated to me. His and Dr. W.'s collections together, form a very fine herbarium for those regions.

The tour of Dr. Wislizenus encompassed, as it were, the valley of the Rio Grande and the whole of Texas, as a glance at the map will show. His plants partake, therefore, of the character of the floras of the widely different countries which are separated by this valley. Indeed, the flora of the valley of the Rio Grande connects the United States, the Californian, the Mexican, and the Texan floras, including species or genera, or families, peculiar to each of these countries.

The northeastern portion of the route traverses the large western prairies, rising gradually from about 1,000 feet above the gulf of Mexico, near Independence, Missouri, to 4,000 feet west of the Cimarron river. The plants collected on the first part of this section, as far west as the crossings of the Arkansas river, are those well known as the inhabitants of our western plains. I mention among others, as peculiarly interesting to the botanist, or distinguished by giving a character to the landscape, in the order in which they were collected, *Tradescantia virginica*, *Phlox aristata*, *Oenothera missouriensis*, *serrulata*, *speciosa*, &c., *Pentstemon Cobaea*, *Astragalus caryocarpus*, (common as far west as Santa Fe,) *Delphinium azureum*, *Baptisia australis*, *Malva Papaver*, *Schrankia uncinata* and *angustata*, *Echinacea angustifolia*, *Aplopappus spinulosus*, *Gaura coccinea*, *Sida coccinea*, *Sophora sericea*, *Sesleria dactyloides*, *Hordeum pusillum*, *Engelmannia pinnatifida*, *Pyrrhopappus grandiflorus*, *Gaillardia pulchella*,* *Argemone Mexicana*, (with very hispid stem and large white flowers.)

The plants collected between the Arkansas and Cimarron rivers are rarer, some of them known to us only through Dr. James, who accompanied Long's expedition to those regions in 1820. We find here *Cosmidium gracile*, Torr. and Gr., which has also been collected about Santa Fe and farther down the Rio Grande; *Cucumis? perennis*, James, found

*Abundant in the sands about the Arkansas river, with beautiful flowers, but only about 6 inches high; certainly annual.

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also near Santa Fe and about Chihuahua, and by Mr. Lindheimer, in Texas; the petals being united about two-thirds of their length, it cannot be retained under the genus *Cucumis; Hoffmannseggia Jamesii*, T. and G., was also gathered on this part of the journey; several species of *Psoralea*, *Petalostemon* and *Astragalus;* also Torrey's *Gaura villosa* and *Krameria lanceolata; Erysimum asperum*, which before was not known to grow so far south; *Polygala alba*, *Lygodesmia juncea*. Here we also, for the first time, meet with *Rhus trilobata*, Nutt., which, farther west, becomes a very common plant.* A new *Talinum*, which I have named *T. calycinum*,[1] was found in sandy soil on the Cimarron. This plant has, like the nearly allied *T. teretifolium* of the United States, a remarkable tenacity of life, so much so that specimens collected, pressed and "dried," in June, 1846, when they reached me in August, 1847, 14 months later, grew vigorously after being planted.

Psoralea hypogæa, Nutt., was collected near Cold spring, and *Yucca angustifolia*, from here to Santa Fe.

From Cedar creek the mountainous region commences with an elevation of near 5,000 feet above the Gulf, and extends to Santa Fe to about 7,000 feet. With the mountains we get also to the region of the pines, and of the cacti. Dr. Wislizenus has here collected two species of *Pinus*, both of which appear to be undescribed, so that I venture to give now a short account of them. The most interesting one, on account of its useful fruit, as well as its botanical associations, is the nut pine of New Mexico, (Piñon,) *Pinus edulis*,[2] nearly related to the nut pine of north-

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[1] *Talinum calycinum*, n. sp., rhizomate crasso, caulibus demum ramosis; foliis subteretibus elongatis, basi triangulari productis; pedunculis elongatis nudis; cyma bracteosa; sepalis 2 ovato-orbiculatis, basi productis, cuspidatis, persistentibus; petalis fugacibus calycembis superantibus; staminibus sub 30; stylo elongato, stigmatibus 3 abbreviatis.

In sandy soil on the Cimarron, fl. in June. Differs from *T. teretifolium* by its larger leaves, larger flowers, much larger persistent sepals, larger fruit and seed. Leaves $1\frac{1}{2}$ to 2 inches long, flowers 10 to 11 lines in diameter; capsule and seeds twice as large as in *T. teretifolium*.

[2] *Pinus edulis*, n. sp.—squamis turionum ovatis acutis adpressis; laciniis vaginarum abbreviatarum circinato—revolutis, demum deciduis; foliis binis brevibus rigidis, curvis, tenuissime striatis, margine laevibus, supra concavis glaucis, subtus convexis viridibus; strobilis sessilibus erectis, subgloboso-conicis, squamis apice dilatato pyramidatis, inermibus; seminibus obovatis, apteris, magnis, testa tenuiore.

Not rare from the Cimarron to Santa Fe, and probably throughout New Mexico. A small tree, 10 to 20, rarely 30 feet high; trunk 8 to 12 inches in diameter; leaves 12 to 18 lines long, and, as is the case in all other pines, concave on the inner or upper surface when in twos, and carinate when in threes, which in our species is very seldom the case. Cones about 18 lines in diameter; seeds about 6 lines long, and 4 in diameter; shell much thinner than a hazlenut's; kernel, when slightly baked, very pleasant.

*Like many other plants mentioned here, it has been collected in abundant and beautiful specimens by *Mr. A. Fendler*, a young German collector, who has investigated the regions about Santa Fe during last season, (1847,) and has made most valuable and well preserved collections, some sets of which he offers for sale. I shall repeatedly be obliged to refer to him when speaking of the flora of Santa Fe.

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astern Mexico, *Pinus osteosperma*,[3] (specimens of which were sent to me by Dr. Gregg, as collected on the battlefield of Buena Vista,) and to the nut pine of California, *P. monophylla*, Torr. and Frem.—these three species being the western representatives of *Pinus Pinea* and *Cembra* of the eastern continent.

The second species, *Pinus brachyptera*,[4] is the most common pine of New Mexico, and the most useful for timber. A third species, *Pinus flexilis*, James, was overlooked by Dr. Wislizenus, but has been collected in fine specimens, by Mr. Fendler, about Santa Fe. Its leaves in fives and pendulous cylindrical squarrose cones assimilate it to *Pinus strobus*; but the seed is large and edible, as Dr. James has already remarked, and the leaves are not serrulate and much stouter. The Piñones, so much eaten in Santa Fe, appear principally to be the product of *Pinus edulis*. I shall have occasion to speak of three other *pines* when I come to the flora of the mountains of Chihuahua.

Linum perenne makes its first appearance here, and continues to Santa Fe, as well as the justly so-called *Lathyrus ornatus*. Several species of *Potentilla*, *Œnothera*, *Artemisia*, and *Pentstemon*, were collected in this district.

Among the most remarkable plants met with were the *Cactaceæ*. After having observed on the Arkansas, and northeast of it, nothing but an *opuntia*, which probably is not different from *O. vulgaris*, Dr. W. came at once, as soon as the mountain region and the pine woods commenced, on several beautiful and interesting members of this curious family, an evidence that he approached the favorite home of the cactus tribe, Mexico.

On Waggon-mound the first (flowerless) specimens of a strange *opuntia* were found, with an erect, ligneous stem, and cylindrical, horridly spi-

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[3] *Pinus osteosperma*, n. sp.—squamis turionum elongato-acuminatis, fimbriatis, squarrosis; laciniis vaginarum abbreviatarum circinato-revolutis, demum deciduis; foliis ternis binisve brevibus, tenuioribus, rectiusculis, margine lævibus, utrumque tenuissime striatis, supra glaucis, subtus virescentibus; strobilis sessilibus, erectis, subglobosis, inermibus; seminibus obovatis apteris, magnis, testa dura.

Mountain borders, near Buena Vista, and about Saltillo. A small tree, 10 to 20 feet high; leaves in threes, more rarely in twos, 1 to 2 inches long, much more slender than in the foregoing species; nut of the same size, but much harder. *Pinus monophylla* has broadly ovate, obtuse, adpressed scales of the young shoots and mostly single, terete leaves; cone and seeds are similar to both others.

[4] *Pinus brachyptera*, n. sp.—squamis turionum longe acuminatis, fimbriatis, squarrosis, subpersistentibus; vaginis elongatis adpressis; foliis ternis (raro binis s. quaternis) utrumque viridibus et aspero striatis; strobilis erectis, ovatis s. elongato conicis, squamis recurvo aculeatis; seminibus obovatis breviter alatis.

Mountains of New Mexico, common. A large and fine tree, often 80 to 100 feet high, 2 and even 3 feet in diameter; sheaths 6 lines long, mostly black; leaves generally in threes, rough, $3\frac{1}{2}$ to 6 inches long, in the specimens before me, crowded towards the end of the branches; cones $2\frac{1}{2}$ to $3\frac{1}{2}$ inches long; seed larger than the wing, without this 3 to 4 lines long and 2 wide.

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nous, horizontal branches. The plant was here only 5 feet high, but grows about Santa Fe to the height of 8 or 10 feet, and continues to be found as far as Chihuahua and Parras. In the latter more favorable climate it grows to be a tree of 20 or 30, and perhaps even 40 feet high, as Dr. W. informs me, and offers a most beautiful aspect when covered with its large red flowers. It is evidently the plant which Torrey and James doubtfully, though incorrectly, refer to *Cactus Bleo H. B. K.* It is nearly allied to *Opuntia furiosa*, Willd., but well distinguished from it; and as it appears to be undescribed, I can give it no more appropriate name than *O. arborescens*,[5] the *tree* cactus, or Foconoztle, as called by the Mexicans, according to Dr. Gregg. The stems of the dead plant present a most singular appearance; the soft parts having rotted away, a net work of woody fibres remains, forming a hollow tube, with very regular rhombic meshes, which correspond with the tubercles of the living plant.

The first *Mammillaria* was also met with on Waggon-mound, a species nearly related to *M. vivipara* of the Missouri, and also to the Texan *M. radiosa*, (Engelm. in Plant. Lindh. inedit.,) but probably distinct from either. Mr. Fendler has collected the same species near Santa Fe.

On Wolf creek the curious and beautiful *Fallugia paradoxa*, Endl., looking like a shrubby *Geum*, was found in flower and fruit; also a (new?) species of *Streptanthus*, and an interesting *Geranium*, which I named *G. pentagynum*,[6] because of its having its five styles only slightly united at

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[5] *Opuntia arborescens*, n. sp., caule ligneo erecto, ramis horizontalibus, ramulis cylindricis, tuberculatis aculeatissimis; areolis oblongis, brevissime tomentosis, aculeos 12 to 30 corneos, stramineo-vaginatos teretes undique porrectos gerentibus; ramulis versus apicem floriferis; ovario tuberculato, tuberculis sub-20 apice sepala subulata et areolas tomentosas cum setis paucis albidis gerentibus; sepalis interioribus 10 to 13 obovatis; petalis obovatis, obtusis s. emarginatis; stigmatibus sub-8 partulis; bacca flava sicca, ovato-globosa, tuberculata, profunde umbilicata.

Mountains of New Mexico to Chihuahua, Parras, and Saltillo; flowers in May and June; fruit, at least about Santa Fe, ripening the second year (Fendler;) in the north 5 to 10, south 20 and more feet high, 5 to 10 inches in diameter, last branches 2 to 4 inches long; spines of the specimens on Waggon-mound 20 to 30 in each bunch; further south only 12 to 20, generally fewer on the under side of the branchlets; spines horn-colored, with straw-colored loose sheaths, from 3 to 10 lines, generally about 6 lines long. Flowers purple, 3 inches in diameter; stamens red; fruit about 1 inch long, yellow.

[6] *Geranium pentagynum*, n. sp., perenne, caule erecto ramoso cum petiolis retrorso-piloso; foliis strigoso-pubescentibus inferioribus 7–, superioribus 3-5-partitis, segmentis inciso-lobatis; pedicellis binis, glanduloso pubescentibus; sepalis glandulosis, longe aristatis; petalis basi villo brevi instructis, ad venas pilosiusculis, obovatis integris; filamentis ciliatis; ovario glanduloso; stylis ima parte solum connatis; capsula glanduloso-pubescente.

On Wolf creek, flowers in June. Several stems 1 foot high from a large ligneous rhizoma; similar to *G. maculatum*, but easily distinguished from this and most other species by the styles being united only for $\frac{1}{4}$ or $\frac{1}{5}$ of their length; flowers of the same size, but aristæ of sepals much larger; leaves only 2 or $2\frac{1}{2}$ inches wide.

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base, while most other *Gerania* have them united for about two-thirds or more of their length.

In the prairies about Wolf creek, in an elevation of between 6,000 and 7,000 feet, the smallest of a tribe of cactaceæ was discovered, numerous species of which were found in the course of the journey south and southeast: several others have also been discovered in Texas. I mean those dwarfish *Cerei*, some of which have been described with the South American genus *Echinopsis*, or have been referred alternately to *Cereus* or *Echinocactus*, and which I propose to distinguish from all these under the name of *Echinocereus*,[7] indicating their intermediate position between *Cereus* and *Echinocactus:* they approach more closely to *Cereus*, in which genus they, as well as the genus *Echinopsis*, should perhaps be included as subgenera.

The species mentioned above is distinguished from all others known to me by its yellowish green flowers, the others having crimson or purple flowers. I have named it, therefore, *Echinocereus viridiflorus*.[8]

A careful examination of the seeds of numerous *cactaceae*, has indicated to me two principal divisions in that family: 1. Cotyledons, more or less distinct, directed with their edges to the edge, (or towards the umbilicus,) and with their faces to the flattened side of the seed; when curved, accumbent. 2. Cotyledons, mostly very distinct, foliaceous, direct with their edges to the faces, and with their faces to the edges of the seed, (or towards the umbilicus;) when curved, incumbent, and often circular or spiral.

The first class comprises *Mammillaria*, with a straight embryo; and

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[7] *Echinocereus*, n. gen. Perigonii tubus ultra germen productus, abbreviatus. Sepala exteriora s. tubi subulata, in axillis tomentosis setas s. aculeos gerentes. Sepala interiora subpetaloidea et petala longiora pluriserialia corollam breviter infundibuliformem s. sub-campanulatam aemulantia. Stamina numerosissima tubo adnata, limbo breviora s. eum subaequantia. Stylus stamina vix superans. Stigma multiradiatum. Bacca pulvilligera setosa s. aculeata, perigonio coronata. Seminum testa dura tuberculata nigra. Embryo vix curvatus cotyledonibus brevibus contrariis.

Globose, or mostly ovate; simple, or mostly branching from the base or cespitose; tubercles, forming few or mostly a great many ribs; bunches of short or long spines, distant or approximate, often very crowded; vertex never woolly; flowers lateral, produced from last year's growth, opening only in sunshine, but for two or three days in succession; closed at night, or in dark weather.

[8] *Echinocereus viridiflorus*, n. sp. ovato-globusus, humilis, sub-13-costatus; areolis lanceolatis, approximatis, junioribus villosis; aculeis 16–18 rectis, radiantibus, lateralibus longioribus fuscis, reliquis albidis, centrali nullo s. elongato robusto, apice fusco; floribus lateralibus; tubo pulvillis 25–30 albo-tomentosis setas albas 5–10 gerentibus stipato; sepalis interioribus lineari-oblongis sub-10; petalis 12–15 lineari-oblongis, obtusis; baccis ellipticis virescentibus, seminibus parvis tuberculatis.

Prairies on Wolf creek, flowers in June; Santa Fe, flowers in May, (Fendler.) Body 1 to $1\frac{1}{2}$ inch high, oval; spines 1 or $1\frac{1}{2}$ to 3 lines long; central spine when present 6 to 7 lines long; flower 1 inch long and wide, outside green brown, inside yellowish green; petals only 2 lines wide, being about 5 lines long.

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doubtless, also, *Melocactus*, seeds of which, however, have not been examined by me; and *Echinocactus*, mostly with a curved embryo. The second class includes *Echinocereus*, with a nearly straight embryo, and very short cotyledons; *Cereus*, with a curved embryo, and foliaceous incumbent cotyledons, (probably also *Echinopsis* and *Pilocereus*, and perhaps *Phyllocactus* and *Epiphyllum;*) *Opuntia*, with a circular or spiral embryo, (circular and with a larger albumen in all *Opuntiae cylindraceae;* spiral and with a much smaller albumen in all *Opuntiae ellipticae*, examined by me,) and very large cotyledons. *Rhipsalis* and *Pereskia* may also belong here, but were out of my reach.

The flowers of all the species belonging to the first class, with the doubtful exception of some *Mammillariae*, make their appearance on the growth of the same year. Those of the second class produce the flowers always upon the growth of the next preceding or former years. The first class may, therefore, be distinguished by the name of *Cactuceae parallelae*, (from the direction of the cotyledons,) or *C. apiciflorae*, (from the position of the flowers.) The second class can be named, in a corresponding manner, *Cactaceae contrariae, or C. lateriflorae.*

Echinocereus is principally distinguished from *Cereus* proper by its low growth; its short, more or less oval stems, which are frequently branching at base, and thereby cespitose; by the diurnal flowers, with short tubes; by the nearly straight embryo, with short cotyledons. From *Echinopsis*, to which some species have been referred, it differs also by the short-tubed diurnal flowers, and by the numerous filaments being adnate to the lower part of the tube. For further particulars compare the note 7. The species of *Echinocereus* inhabit Texas and the northern parts of Mexico, where *Cerei* proper are very rare. They extend even farther north than the *Echinocacti*, but appear to be excluded from the old limits of the United States, where the cactus family is represented only by some *Opuntiae* and *Mammillariae*. The southern limits of the *Echinocerei* are unknown to me, but I doubt whether they extend far in that direction; the nearly-related *Echinopses*, on the contrary, appear to be exclusively inhabitants of South America, especially the La Plata countries.

As I am speaking of the geographical distribution of the *Cactaceae*, I may as well add here that *Mammillariae* were found throughout the whole extent of Dr. Wislizenus's tour, and that at least four species occur in Texas. *Echinocacti* were observed only south of Santa Fe, and from there to Matamoros, but none on the highest mountains, which were occupied by *Opuntiae*, *Mammillariae*, and *Echinocerei;* two *Echinocacti* have been found in Texas. Only two species of true *Cerei* were seen; one of a peculiar type about Chihuahua, and another near the mouth of the Rio Grande, which does not appear to differ from the wide-spread *C. variabilis*, Pfeiff. *Opuntiae ellipticae*, as well as *cylindraceae*, were observed from New Mexico to Matamoros, and species of both are also found in Texas. *Melocacti*, *Phyllocacti*, and other genera of *Cactaceae*, not mentioned above, were not met with.

The notes and collections of Dr. Wislizenus confirm the opinion of that acute observer and successful cultivator of *Cactaceae*, Prince Salm-Dyck, viz: that most species of this family have a very limited geographical range, the most striking exception being those belonging to the genus *Opuntia*.

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On the same day two other species of *Echinocereus* were found in pine timber, both with beautiful deep red flowers.[9]

We shall have occasion to speak of others hereafter.

After leaving Santa Fe, Dr. Wislizenus directed his course southward along the Rio Grande. The country was partly mountainous and rocky; partly, and principally along the river, sandy; on an average between 4,000 and 5,000 feet above the ocean. Here we find again some of the plants of the plains and of Texas, as *Polanisia trachysperma*, T. and G.; *Hoffmanseggia Famesii*, T. and G. An interesting *Prosopis* with screw-shaped legumes nearly allied to *P. odorata*, Torr. and Frem., of California, was the first shrubby mimoseous plant observed during the journey, a tribe which hereafter becomes more and more abundant; *Mentzelia* sp. *Cosmidium gracile*, *Eustoma*, *Heliotropium currasavicum*, *Maurandia antirhiniflora*, a beautiful large flowered *Datura*, *Abronia*, *Hendecandra texensis*, and many others. Near Olla the first specimens appeared of a new species of *Larrea*,[10] the first and most northern form of the shrubby

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[9] *Echinocereus triglochidiatus*, n. sp. ovato-cylindricus, 6–7 costatus, costis undulatis, acutis; areolis sparsis, orbiculatis, junioribus albo-lanatis; aculeis 3–6, plerumque 3, rectis compressis angulatis, cinereis, sub-deflexis; floribus lateralibus, tubo pulvillis 15–20 albo-tomentosis setas spinosas apice fuscas 2–5 gerentibus stipato; sepalis interioribus sub-12 oblongo-linearibus obtusis; petalis 12–15 obovatis obtusis; staminibus petala subaequantibus; stigmatibus 8–10 virescentibus.

On Wolf creek, in pine woods, flowers in June; Santa Fe (Fendler) 4 to 6 inches high, 2 to $2\frac{1}{2}$ in diameter; spines in young specimens 4 to 6, in older ones generally 3, two lateral ones 8 to 14 lines long, one bent down only 6 to 8 lines long. Flowers 2 to $2\frac{1}{2}$ inches long, 2 inches in diameter; setose spines of tube 3 to 6 or 7 lines long; petals deep crimson, 6 to 7 lines wide; filaments and anthers red. In specimens from Santa Fe, collected by Mr. Fendler, the flowers are near 3 inches long, the petals 8 to 9 lines wide, and the setae on the tube are spinous, with brownish points.

Echinocereus coccineus, n. sp. globoso ovatus, 9–11 costatus, costis tuberculosis subinterruptis; areolis ovatis junioribus albo-tomentosis; aculeis radialibus 9–10 albidis, rectis, oblique porrectis, superioribus brevioribus; centralibus 1–3 longioribus albidis s. corneis; floribus lateralibus; tubo pulvillis 18–25 albo-tomentosis, setas tenues albidas 8–11 gerentibus stipato; sepalis interioribus 8–10 oblongo linearibus obtusis; petalis 10–12 obovatis obtusis; staminibus brevioribus; stigmatibus 6–8 virescentibus.

With the foregoing, also about Santa Fe.—Only $1\frac{1}{2}$ to 2 inches high, $1\frac{1}{4}$ to $1\frac{1}{2}$ inch in diameter; like most other species of this genus, either single or generally branching from the base and cespitose, sometimes forming clusters of 10 to 15 heads. Spines terete all more or less erect, none appressed as in many other species; radiating ones 3 to 6, central ones 8 to 10 lines long. Flowers $1\frac{1}{2}$ to $1\frac{3}{4}$ inch long, and 1 to $1\frac{1}{2}$ wide when fully expanded; bristles of tube 3 to 6 lines long; petals deep crimson 4 to 5 lines wide; filaments red, anthers red or yellow. The flowers resemble much those of the last species, but the plant is very different.

[10] *Larrea glutinosa*, n. sp. divaricato-ramosissima, ad nodos glutinosa; foliis breviter petiolatis, bifoliolatis, foliolis oblique ovatis mucronatis, ner-

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Zygophyllaceae, more abundant farther south. In the same neighborhood the mezquite tree or shrub was first met with, probably *Algarobia glandulosa*, T. and G. From here the mezquite was abundantly found down to Matamoros, but the specimens collected appear to indicate that there are at least two different species.

On the next day, near Sabino, an interesting bignoniaceous shrub was collected for the first time, undoubtedly the *Chilopsis* of Don, which farther south appears more abundantly. Its slightly twining branches, willow-like slender glutinous leaves, and large paler or darker red flowers, render it a very remarkable shrub. Dr. Gregg mentions it under the name of "*Mimbre*," as one of the most beautiful shrubs of northern Mexico. The character given by Don, and that of Decandolle, appear defective, though I cannot doubt that both had our plant in view. From the very complete specimens obtained both by Dr. Wislizenus and Dr. Gregg, I am enabled to correct those errors.[11]

Near Albuquerque a curious *Opuntia* was observed; it evidently belongs to *Opuntiae cylindraceae*, but has short clavate joints, which make the

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vosis, coriaceis, adpresse pilosis glutinosis; floribus inter folia opposita solitariis; fructu 5-cocco villoso.

Common from Olla and Fray Cristobal, in New Mexico, to Chihuahua and Saltillo; also about Presidio, (Dr. Gregg;) flowers in March and April; fruit ripe in July. Shrub 5 to 8 feet high, very much branched, very glutinous; used as a sudorific and diuretic, and called *gobernadora*, or in the north *guamis*, according to Dr. Gregg. Leaflets 3 to 6 lines long and half as wide, cuspidate or mucronate; ovary 5 celled, each cell with 3 or 4 ovules; fruit 3 lines in diameter, globose, attenuated at base; seeds by abortion only one in each cell, falcate, smooth, shining.

[11] *Chilopsis* Don, char. emend. Calyx ovatus plus minusve bilobus, lobo altero breviter 3, altero 2 dentato; corolla basi tubulosa, curvata, fauce dilatata, companulata, limbo 5-lobo, crispato-crenato; stamina 4 fertilia didynama, antherarum nudarum lobis ovatis, obtusis; quintum sterile brevius nudum; ovarium ovatum; stylus filiformis, stigma bilamellatum; capsula siliquaeformis, elongata, bilocularis, septo contrario placentifero; semina transversa margine utroque comosa.

An erect Mexican shrub, 8 to 12 feet high, ends of branches often slightly twining; branches smooth, and glutinous or rarely woolly; lower leaves somewhat opposite, upper ones sparse, lanceolate-linear, long-acuminate, glabrous or glutinous; racemes compound, terminal, pubescent; pedicells bracted, corolls rose-colored or deeper red or purple.

Along water-courses or in ravines, from Sabino, near Albuquerque to Chihuahua, Saltillo and Monterey. Leaves 2 to 4 inches long, 1 to 3 lines wide; flowers $1\frac{1}{4}$ to $1\frac{1}{2}$ inch long; fruit 6 to 10 inches long; seeds with the coma 6 lines long.

There are perhaps two species—one from the neighborhood of Saltillo, with larger, paler flowers, broader, not glutinous leaves, and woolly branchlets, perhaps the *Ch. saligna* Don; the other from New Mexico and Chihuahua, with longer, narrower glutinous leaves, perfectly glabrous, glutinous branchlets, and darker and smaller flowers; may be *Ch. linearis*, DC., or a new species, *Ch. glutinosa*. The Calyx is variable in both.

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name of *O. clavata*[12] most appropriate. A singular plant, with the habit of a *Ranunculus*, but nearly related to *Saururus*, was also found in this neighborhood among grass on the banks of the Rio Grande. The genus has been described by Nuttall from specimens collected by him in California, but whether his *Anemopsis californica* is specifically identical with the new Mexican plant, remains to be seen, as this last has regularly 6-leaved involucres, about 6 stamens, and is perfectly glabrous.

While the last mentioned plants indicate that we approach another botanical region, we are surprised to meet here with *Polygonum amphibium*, common in the old and in the new world, and *Cephalanthus occidentalis*, so widely diffused in the United States.

The famous desert, the Jornada del Muerto, furnished, as was to be expected, its quota of interesting plants. A *Crucifera* near *Biscutella*, of Europe, but with very short styles and white flowers, was here met with abundantly. I had considered it as the type of a new genus, when I found in Hooker's London Journal of Botany of February, 1845, Harvey's description of his new Californian genus *Dithyrea*,[13] which probably must be made to embrace our plant as a second species.

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[12] *Opuntia clavata*, n. sp. prostrata, ramulis ascendentibus, obovato-clavatis, tuberculatis; areolis orbiculatis albo-tomentosis, margine superiore setas albas spinescentes gerentibus; aculeis albis complanatis; radiantibus 6–12 minoribus, centralibus 4–7 majoribus, longioribus deflexis; floribus terminalibus; areolis ovarii 30–45 albo-tomentosis, setas albas 10–15 gerentibus; sepalis interioribus ovato-lanceolatis acuminatis s. cuspidatis; petalis obtusis, erosis saepius mucronatis; stigmatibus 7–10 brevibus erectis; bacca elongato-clavata, profunde umbilicata, setaceo-spinosa.

About Albuquerque (W.,) about Santa Fe, on the high plains, never on the mountains, (Fendler.) Mr. Fendler informs me that the ascending joints sprout from or near their base, and that in this manner they finally form a large spreading mass, often 2 and even 4 feet in diameter, to which the white shining spines give a very pretty appearance. Joints or branchlets $1\frac{1}{2}$ to 2 inches long, tubercles at their base smaller, with shorter spines, towards the upper and thicker end larger, with stouter and longer spines; radial spines 2 to 4, central ones from 4 to 9 or 10 lines long; ovary 15 lines long, flower yellow, 2 inches in diameter; stigmas only $1\frac{1}{2}$ line long; fruit apparently dry and spiny, $1\frac{1}{2}$ to $1\frac{3}{4}$ inch long; seeds smoother than those of most other opuntiae, rostrate, with a circular embryo. Apparently near *Opuntiae platyacanthae*, Salm.; but the tuberculated joints and the shape of the embryo approach it closely to *O. cylindraceae*.

[13] *Dithyrea*, Harv., char. emendat. Sepala 4 basi aequalia oblongo-linearia. Petala 4 spathulata, basi ampliata. Stamina 6 tetradynama, libera, edentula. Stylus brevissimus, stigma incrassatum. Silicula sessilis, biscutata, basi et apice emarginata, a latere plano-compressa. Semina in loculis solitaria, compressa, immarginata, horizontalia. Cotyledones planae radiculae descendenti septum spectanti accumbentes.

Annual (all?) plants of California and New Mexico, with stellate pubescence, repando-dentate leaves, yellow (?) or white flowers in simple terminal racemes.

Dithyrea Wislizeni, n. sp., erecta incano-pubescens ramosa, foliis brevi-

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A new species of *Talinum*, with single axillary flowers, was found for the first time in the Jornada, but was again collected further south, towards Chihuahua. *Dalea lanata*, *Centaurea americana*, *Sapindus marginata*, and a *Bolivaria*, probably identical with a new Texan species, brought to mind the flora of Arkansas and Texas, while the gigantic *Echinocactus Wislizeni*,[14] reminds us again that we are approaching the

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ter petiolatis repando-dentatis, racemo umbelliformi, demum laxo elongato; pedicellis eglandulosis, horizontalibus, flore longioribus, sepalis calycis aperti patulis; petalis (albis) obovatis, unguiculatis basi dilatata sub-cordatis; stigmate cordato conico; siliculis basi profundius emarginatis.

Common in sandy soil near Valverde and Fray Cristobal, north of the Jornada del Muerto; flowers in July. Plant about 1 foot high, annual or biennial; leaves ovate-lanceolate, attenuate in the short petioles, closely resembling those of some species of *Gaura;* pedicells filiform, longer than the flower or fruit; flowers white, about 3 lines in diameter, open; petals obovate, with a long and distinct claw, which is widened at base; filaments also thickened at base; ovary tomentose; style hardly visible, more distinct in the fruit, which is 5 to 6 lines in transverse diameter, and about half as much from base to top; the valves appear to be closed at their attachment to the subulate solid dissepiment.

Dithyrea californica, Harv., pedicellis basi bi-glandulosis horizontalibus, flore multo brevioribus; sepalis calcycis cylindrici clausi erectis; petalis (aureis?) lineari-spathulatis; stigmate bilobo; siliculis apice profundius emarginatis.

Easily distinguished by the characters just enumerated from the New Mexican plant; though the difference in calyx and stigma will not permit a generic separation.

[14] *Echinocactus Wislizeni*, n. sp., giganteus, vertice villoso-tomentoso; costis . . . . acutis crenatis; areolis oblongis, approximatis, junioribus fulvo-tomentosis; aculeis radialibus flavis, demum cinereis, porrectis; lateralibus sub 15 setaceis elongatis laeviusculis, summis infimisque 5–6 brevioribus robustioribus, annulatis; centralibus rubellis annulatis, 3 rectis sursum versis, 1 inferiore robustissimo, supra plano, apice reflexo-hamato; floribus sub verticalibus, ovario et tubo brevi campanulato sepalis imbricatis, auriculato-cordatis 60-80 stipato; sepalis interioribus 25–30 ovatis obtusis; petalis lanceolatis mucronatis, crenulatis; stylo supra stamina numerosissima brevia longe exserto; stigmatibus filiformibus 18–20 erectis; bacca ovata, lignosa, imbricato-squamosa.

Near Doñana, collected in August with buds, open flowers, young and ripe fruits on the same specimen. It belongs therefore to those *Echinocacti* which flower through the whole season, like *E. setispinus*, Engelm., (in Plant. Lindh.) of Texas, while others are in flower only during a week or two in spring, e. g. *E. texensis*, Hpfr. In the latter, the young bunches of spines, together with the flower buds in their axills, come out at once in spring, and none more are formed during the season, while in the first they are gradually developed during the whole season. Plant $1\frac{1}{2}$ to 4 feet high; oval, with a smaller diameter. Areolae 6 to 9 lines long, only 6 lines distant from one another; radial spines $1\frac{1}{2}$ to 2 inches long; straight central ones $1\frac{1}{4}$ to $1\frac{1}{2}$, and large hooked ones 2 to $2\frac{1}{2}$ inches long;

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Mexican plateau. This enormous cactus attained generally a height of 1½ to 2 feet; specimens 3 feet high were rare, but one specimen was found which measured 4 feet in height, and near 7 feet in circumference; its top was covered with buds, flowers, and fruits, in all stages of development. In size it ranges next to *Echinocactus ingens*, Zucc., specimens of which 5 to 6 feet high were collected near Zimapan, in Mexico. Another Mexican cactus, *E. platyceras*, Lem., is said to grow 6, and even 10 feet high, and proportionately thick. *E. Wislizeni* is therefore the third in size in this genus.

From the same neighborhood a beautiful *Mammillaria* was sent in dried, as well as living specimens. It appears to be one of the few *Mammillariae longimammae*, though it differs in having purple, not yellow flowers, and stiffer spines. By the name I have given it, *M. macromeris*,[15] I intended to indicate the unusually large size of different parts of the plant, the tubercles, the spines, and the flowers.

In the same region a strange plant was obtained for the first time, but then without flowers or fruit, and which, to the casual observer, appeared as curious as it is puzzling to the scientific botanist; single spiny sticks or stems having a soft and brittle wood, and a great deal of pith in the centre, one or more from the same root, but always without branches, 8 to 10 feet high, not more than half an inch thick, frequently overtopping the brush among which they were found, only towards the top with a few bunches of already yellow leaves. In the following spring the splendid crimson flowers of this plant were found by Dr. W. between Chihuahua and Parras, and to Dr. Gregg I am indebted for mature fruit, collected near Saltillo (and Monterey.) The plant proved to be a *Fouquiera*, two species of which had been found in Mexico by Humboldt; one of them, the *F. formosa*, a branching shrub, was only known in the flowering state; the other, *F. spinosa*, a spinous tree, only in fruit. The structure of the ovary of the first appeared to differ so much from that of the capsule of the second, that it was afterwards deemed necessary to distinguish both generically, and the second constituted then the genus *Bronnia*. Having both flowers and fruit of a third *Fouquiera*, I am enabled to solve the dif-

Known here under the name of Ocotillo

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yellow flowers 2 to 2½ inches in length, campanulate; fruit 1¼ to 1½ inch long, topped with the remnants of the flower of the same length; seeds black, rough, obliquely oval, with considerable albumen, in which the curved cotyledons are partly buried.

[15] *Mammillaria macromeris*, n. sp. simplex, ovata, tuberculis laxis, e basi latiore elongatis cylindricis, incurvis, sulcatis; areolis junioribus albotomentosis; aculeis angulatis rectis, elongatis, omnibus porrectis; radialibus sub-12 tenuioribus, albidis; centralibus sub-3 robustioribus, longioribus, fuscis; floribus maximis, roseis; sepalis ovatis, acutis, fimbriatis; petalis mucronatis, fimbriatis; stylo supra stamina brevia longe exserto, stigmatibus 8.

Sandy soil near Doñana, in flower in August. All my specimens single; trunk oval, 1 to 2 inches high; tubercles in 8 rows, 12 to 15 lines long, incurved; groove at first tomentose down to the tomentose supra axillary areola; radial spines 1 to 1½, central 1½ to 2 inches long; flowers 2½ to 3 inches in length and diameter, probably larger than in any other species of this genus; petals rose-colored, darker red in the middle.

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2 or 3 to 10 and more (Gregg)
or stump, which is sometimes 4 to 8 inche
ft, and 3–6 inches diameter

ficulty to some extent, and prove the necessity of reuniting *Bronnia* w
Fouquiera.[16] The flower of *Fouquiera splendens*, as I have named
northern plant, is that of a true *Fouquiera*, while the fruit is nearly tha
Bronnia!

Towards El Paso a curious capparidaceous plant was collected, wh
appears to be nearly allied to the Californian *Oxystylis* of Torrey and F
mont, and forms with it a distinct group in that family, approaching v
closely to *Cruciferae*, as has been remarked by Professor Torrey.

I have named this new genus (in honor of its discoverer, who h
though unaided and often embarrassed in different ways, done so mu
towards the advancement of our knowledge of those northern province

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[16] *Fouquiera*, Humb. B. Kunth, charact. emendat. Calyx 5-sepal
imbricatus, persistens. Corolla hypogyna, gamopetala, longe tubul
limbo brevi 5-partito, patente, aestivatione incomplete contorta. Stam
10–15, hypogyna, exserta; filamenta inferne arcuata villosa, basi inte
cohaerentia; antherae biloculares, longitudinaliter dehiscentes, mucro
tae, basi cordatae, imo dorso affixae, introrsae. Ovarium liberum sess
placentae 3 parietales ad centrum productae neque connatae, ovarium i
incomplete triloculare; ovula sub-18 ascendentia, in quaque placent
biseriata; stylus filiformis trifidus. Capsula coriacea trivalvis; valvae
dio placentiferae; placentae demum margine centrali connatae et a va
solutae placentam singulam centralem triangularem formantes. Sem
3–6 complanata, alata s. comosa; albumen tenuissimum membranace
embryo magnus rectus, cotyledonibus planis, radicula breviori intera.

Mexican shrubs or trees, with soft fragile wood, and tuberculated, ang
branches, the tubercles bearing spines, and in their axills single or fasc
late obovate entire leaves; splendid crimson flowers in terminal or sub
minal spikes or panicles. At present only the following species of
genus are known:

1. *F. formosa*, H. B. K. fruticosa, spinis brevissimis, foliis solit
oblongis subcarnosis; floribus sessilibus arcte spicatis, staminibus 12; s
apice tripartito.

2. *F. splendens*, n. sp. fruticosa, simplex, spinis longioribus, foliis
ciculatis, obovato-spathulatis, membranaceis; floribus breviter pedicel
in paniculam thyrsoideam congestis, staminibus 15; stylo ultra med
tripartito, seminibus 3-6 comosis.

3. *F. spinosa*, H. B. K., arborea, ramosa, spinis longioribus, foliis
rumque fasciculatis, obovato-oblongis, membranaceis; floribus pedice
corymboso-paniculatis; staminibus 10; seminibus 3 membranaceo-alati

Fouquiera splendens is a common plant from the Jornada del Mu
in New Mexico, to Chihuahua, Saltillo, and Monterey; flowers in A
fruit by the end of May.

A general description has already been given in the text. In
Mexico it was seen only 8 or 10 feet high, but farther south it was f
from 10 to 20 feet high, and in favorable localities it is said to grow
30 feet high, and rarely thicker than about one inch in diameter.
smooth and ashy gray; spines horizontal, slightly curved, 6 to 10
long, disappearing on old stems; leaves deciduous fascicled in the axi
the spines towards the top of the stem, short-petioled, spathulate, ob
membranaceous, glabrous, somewhat glaucous, 9 to 12 lines long, a

† and near Saltillo & Monterey (Gregg) as far
Chihuahua (Wislizenus)

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Mexico—the first naturalist, it is believed, who explored the regions between Santa Fe, Chihuahua, and Saltillo) *Wislizenia!*[17] From *Oxystylis* it is principally distinguished by its long stipitate ovary and capsule, which latter is reflexed, and by the elongated racemes; it may, however, have to be united with that genus.

On the mountains about El Paso, another of those cylindraceous *Opuntiae* was found, but much thinner and more slender than both species, mentioned previously. To judge from an imperfect description it must be nearly related to the Mexican *O. virgata*, Hort. Vind. I have given it

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to 4 lines wide; panicles from the upper fascicles of leaves, near the top, one or several, erect, crowded, 4 to 6 inches long; pedicells bracted, longer than the yellowish chartaceous calyx; sepals orbicular 2 lines long; corolla scarlet 9 to 10 lines long; filaments at base slightly cohering with one another, and with the base of the corolla, villous below and with a small horizontal process, which forms an arch over the ovary. Placentae in the ovary lateral, 3, bearing each 6 ascending acute ovula, at the inner margin, where they appear to touch one another without being actually united at that stage of the growth. Soon after they probably adhere in the centre to each other, and towards the ripening of the capsule detach themselves from the valves, presenting a free central triangular spongy placenta, with about 6 (or by abortion less) seeds. Capsule coriaceous oval, acutish, light brown, about 6 lines long. Seeds compressed, integument expanded in a wing, which is cordate at the upper end, and finally resolves itself into a coma of silky fibres. If my view of the ovary and fruit of this plant is correct, the ovary is 1-celled, with 3 lateral placentae—that of a true *Fouquiera*, the ripe capsule is 1-celled, with one central placenta—that of *Bronnia*, and the unripe fruit, must be 3-celled!

Fouquiera splendens grows readily from cuts, and is used about Chihuahua for hedges and fences.

[17] *Wislizenia*, n. gen., sepala 4; petala 4 oblonga, breviter unguiculata; stamina 6 toro cylindrico inserta; filamenta filiformia longe exserta, aestivatione inflexa; ovarium longe stipitatum, globosedidymum, biloculare, loculis 2-ovulatis; stylus subulatus, elongatus, stigma globosum. Capsula siliculaeformis, didyma tuberculata cum stipite in pedicellum filiformem refracta, bilocularis, loculis plerumque per abortum 1-spermis; valvae urceolate a dissepimento pertuso solutis, semen includentibus; semen conduplicato-reniforme, laeve; cotyledones radiculae superae incumbentes.

A glabrous new Mexican annual, much branched, of the habit of *Cleomella*, with ternate leaves, distinct laciniate fimbriate stipules, and bracted at last elongated racemes, small yellow flowers; fruit reflexed, stipe with the equally long (not spinous) style, and the small dissepiment persistent after the falling off of the valves.

W. refracta, n. sp. On the upper crossing of the Rio Grande, near El Paso; flowers and fruit in August. An interesting and quite anomalous plant, on account of its fruit with an almost complete dissepiment, and of its stipules and bracts. Tuberculated valves of the capsule separating from the placentae, and though open, retaining the only (rarely two) seed placentae forming a complete dissepiment, which, in the perfectly ripe and dry state, finally becomes perforated in the centre.

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the name of *O. vaginata*,[18] as the straw-colored loose sheaths of the lor spines are very remarkable. A new *Echinocereus* was also collected her which, on account of its dense covering with small spines, I have name *E. dasyacanthus*.[19] I have in cultivation one of the largest specimen seen by Dr. Wislizenus, which is one foot high. In this neighborhoo *Opuntia Tuna*, Mill., was seen for the first time, and this is perhaps th most northern limit of that extensively diffused species, as well as *Agave americana*, another common Mexican plant. Both were found greater perfection near Chihuahua, and from there constantly down Monterey and the mouth of the Rio Grande; the *Opuntia* appears to exten also high up in Texas.

Together with these a *Dasylirion*, perhaps the same as the Texa species, was found here, and afterwards again near Saltillo.

From El Paso to Chihuahua, the road lies in part through a dreadfull arid sandhill district, where a peculiar *Martynia*[20] was observed, and fu

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[18] *Opuntia vaginata*, n. sp. caule lignoso, erecto, ramulis teretibus vi tuberculatis; areolis orbiculatis, albo-tomentosis, margine superiore fascicu lum setarum brevium fuscarum, inferiore aculeum elongatum corneu vagina laxa straminea involutum, deflexum gerentibus; floribus parvi ovario obovato, areolis 13 tomentosis setigeris stipato; sepalis interioribus et petalis 5 obovatis mucronatis; bacca obovata profunde umbilicata, ca nosa, aurantiaca, seminibus paucis.

On the mountains near El Paso; in August in flower and fruit. Belong to *Opuntiae cylindraceae graciliores*, (Salm-Dyck;) perhaps nearest to *virgata*, H. V., but distinguished by the longer deflexed spines. App rently 3 or 4 feet high, ultimate branches $2\frac{1}{2}$ to 3 lines in diameter; spine single, $1\frac{1}{2}$ to 2 inches long, rarely with a second smaller one, straigh more or less deflexed; epidermical sheath yellow or brownish, very loos at last coming off. Ovary 4 to 5 lines long; flower 6 to 9 lines in diam ter, pale yellow, with a greenish tinge; stigma conic, with 5 adpresse segments; fruit 7 to 8 lines long.

[19] *Echinocereus dasyacanthus*, n. sp. ovato-oblongus, s. subcylindricu 17–18 costatus, costis tuberculatis subinterruptis, areolis approximati ovato-lanceolatis, junioribus albo-villosis; aculeis albidis, junioribus api rufidis, radialibus sub-18 porrectis, summis brevioribus tenuioribus, late alibus inferioribusque longioribus; centralibus 4–6 pluribus deflexis.

El Paso del Norte. The specimen before me, one of the largest, is 1 inches high, and $3\frac{1}{2}$ inches below, and 2 inches above in diameter; wo on the young areolae unusually long, deciduous; upper spines 3 lin long, lower lateral ones slightly compressed 6 to 7 lines long, lowest lines long; central spines nearly as long as the last, stouter than the othe From *E. pectinatus* and *E. caespitosus*,* which it resembles, it is disti guished by the longer, not appressed spines, the larger number and size the central spines, &c.

[20] *Martynia arenaria*, n. sp. annua, glanduloso-pilosa foliis alterni longe petiolatis, cordatis, 3–5–7 lobatis, lobis rotundatis, repando-dentic latis; bracteis lanceolatis calycem obliquum, infra fissum, dimidium a quantibus; staminibus 4; rostro pericarpium aequante.

Sandhills below El Paso, flowers August. Leaves $1\frac{1}{2}$ to 2 inches wi

*See note 45.

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ther on, through a lovely country, which, at that season, (August,) after the annual rains, was covered with a luxuriant vegetation. The elevation of the country is here between 4,000 and 5,000 feet above the gulf.

The rare *Cevallia sinuata*, which Dr. Gregg has also sent from Monterey, was found in this part of the journey. Here also occurred a perennial species of *Linum*, with yellow petals, so far, in America, the only perennial yellow flowering *Linum*; it is distinguished by its long aristate sepals, whence the name.[21] Several *Oenotherae*, not seen before, made now their appearance; different species of *Gilia*, a number of *Nyctagineae*, several *Asclepiadaceae*, *Malvaceae*, *Cucurbitaceae*, *Compositae*, and others, were here collected; including a number of new species, which only want of time and references have for the present prevented me from describing. Near lake Encinillas another *Martynia*[22] was found, which, in its foliage, comes nearer to *M. proboscidea*, but is readily distinguished by its purple flowers. A beautiful yellow-flowering bignoniaceous shrub, probably *Tecoma stans*, Juss., seen more frequently further south, was observed for the first time near Gallejo spring. Shrubby *Algarobiae* were seen more plentifully, as also some other *Mimoseae*.

Here would be the proper place to introduce a notice of the several species of *Yucca* found by Dr. Wislizenus. But, unfortunately, the labels of the specimens were partly lost, so that it is impossible at this time to arrange leaves, flowers, and fruits properly. Certain it is that several species besides *Yucca angustifolia*, mentioned above, were seen; that the leaves of all of them have filamentose edges, some with very fine, others with very coarse fibres on their margin; that the majority bear juiceless capsules with very thin, paperlike seeds, but that one species produces an edible succulent fruit with very thick seeds. Fortunately the seeds col-

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and long; flowers spotted, "yellow," (Dr. W.,) a little smaller than in *M. proboscidea*.

[21] *Linum aristatum*, n. sp., caulibus e rhizomate ligneo pluribus, ramosissimis, angulatis; foliis sparis subulatis, aristatis, superioribus bracteisque denticulatis; sepalis lanceolato-linearibus trinerviis, aristatis, margine membranaceo glanduloso-denticulatis; petalis (flavis) calycem sub-duplo superantibus; stylis coalitis; capsula ovata, acuta, sepalis persistentibus bis breviore.

In sandy soil near Carizal, south of El Paso; collected in August, in flower and fruit. The rhizoma in the specimen before me is 6 inches long and 3 to 4 lines in diameter, white; stems numerous, 1 to 3 feet high, divaricately branched; upper leaves (lower not seen) 3 to 4 lines long, sepals 4 lines long; flowers 10 lines in diameter; petals sulphur yellow; styles united for about three-fourths of their length; capsule 2 lines long.

[22] *Martynia violacea*, n. sp., annua, foliis alternis, cordatis, repando-sinuatis, acute denticulatis, glabriusculis; bracteis lanceolatis calyce obliquo, infra usque ad basin fisso dimidio brevioribus; staminibus 4; rostro pericarpium superante.

Near lake Encinillas, north of Chihuahua, flowers August; leaves 4 to 6 inches long, and nearly as wide, indistinctly sinuate-lobed, beset with small, sharp, distant teeth, flowers from pale red to deep violet purple, as large as in *M. proboscidea*.

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lected by Dr. W. arrived here in the best condition, and some hav already germinated, so that we may hope to raise some of these specie *Yucca aloëfolia*, of the southern United States and Mexico, is said also t bear an edible fruit, but has serrulate leaves; we have, therefore, differer species of *Yucca* with edible fruits, which may constitute a peculiar sec tion in this genus.

The soil appeared to be too fertile here for the production of *Cacti*; an with the exception of some *Opuntiae*, the only species collected betwee Paso and Chihuahua, about 100 miles south of the former place, was *Cereu Greggii*[23], which was peculiarly interesting, as it is probably the mos northern form of *Cereus* proper. The specimens sent for cultivation b Dr. W. were unfortunately dead when they arrived here, and neithe flower nor fruit had been obtained; but Dr. Gregg has collected the sam species near Cadena, south of Chihuahua, in flower, from which I com pleted the description. I could not have given it a more appropriate nam than that of the zealous and intelligent explorer of those far off regions. learn from Prince Salm-Dyck that a *Cereus*, probably the same species was sent to England by Mr. Potts, of Chihuahua, but his specimens also did not live; they were very remarkable for having a thick turnip-shape root. Neither Dr. W. nor Dr. G. having paid attention to the root, I am unable to say whether their specimens agreed with those of Mr. Potts in this particular.

Dr. Wislizenus was forced to go from Chihuahua westward to Cosihui riachi. However prejudicial this involuntary interruption of his journey may have been to the primary objects of his expedition, it appears that he could not have selected a more favorable field for botanical researches Amongst the porphyry mountains of Cosihuiriachi and Llanos, which vary from 6,000 to 8.000 feet in height, and their deep chasm-like valleys, a great many undescribed species of plants were found; in fact almost everything collected there appears to be new!

Among the trees, I mention three species of pines, entirely different from those found farther north, but perhaps identical with some species from the Pacific coast. The most magnificent of these three is a species nearly related to *Pinus strobus* and *Pinus flexilis*, which I name *P. strobiformis*.[24] Its size and growth, its foliage, as well as the shape of the

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[23] *Cereus Greggii*, n. sp., erectus, ramosus, pentagonus; areolis distantibus oblongis, nigro-tomentosis; aculeis nigris, brevissimis, e basi incrassata subulatis, acutissimis, 6-9 radialibus subrecurvis, infimis longioribus centrali singulo deflexo minuto; tubo floris elongato, areolis 60–80 cinereo tomentosis setas 6-12 nigricantes s apice albidas gerentibus stipato; sepalis interioribus 15–20 et petalis 15–20 lanceolatis, acuminatis, integris.

North and south of Chihuahua; flowers April and May. Stem 1 to 2 feet high, about 6 lines in diameter; spines ½ to 1 line long, extremely sharp; flower about 6 inches long and 2 inches in diameter, bristles of the tube 1½ to 3 lines long; interior sepals reddish green, petals pale purple.

[24] *Pinus strobiformis*, n. sp., squamis turionum ovatis acuminatis; vaginis laxis, patulis, deciduis; foliis quinis filiformibus, supra albo lineatis acute carinatis, subtus convexis, margine tenuissime serrulatis; strobili cylindricis, elongatis, squamis obtusis inermibus, demum recurvis.

Highest peaks about Cosihuiriachi. The largest pine in this region 10

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cones, resemble the common white pine of the north, but the cones are two or three times as large, not to speak of the other differences. It only grows on the highest mountains of this region, of about 8,000 feet elevation, and attains the height of 100 to 130 feet.

Pinus macrophylla,[25] another inhabitant of the higher mountains of Chihuahua, is more common than the last; like it, it closely resembles a well known species of the United States, *P. australis*, from which it differs by its short cones, which have on each scale a mammillary recurved tubercle, and by having the leaves not only in threes, but also in fours and even in fives. It may be near *P. occidentalis* of the interior of Mexico, but that has the regularly five leaves in each sheath.

Pinus Chihuahuana,[26] is the common pine of Cosihuiriachi and the mountains of Chihuahua, in general at an elevation of about 7,000 feet. It grows only 30 to 50 feet high, and resembles somewhat *P. variabilis*, though sufficiently distinct. Dr. Wislizenus was unable to obtain specimens of a fourth pine, which is said to grow on the still higher mountains to the west, near Jesus-Maria, bearing cones 15 or 18 inches in length.

On the highest peaks in this region a species of *Arbutus* was found, which the inhabitants call *Matronia;* it is a small tree with a smooth, red bark, bearing in November and December red edible berries. If it is at all distinct from *A. Menziesii*, Pursh, of the northwest coast, which it closely resembles, it ought, from the color of its bark, bear the name of

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to 130 feet high. Sheaths 6 lines long, very deciduous, leaves 2 to $3\frac{1}{2}$, mostly 3 inches long; cone about 10 inches in length, very resinous. This species forms with *Pinus strobus* and *Pinus flexilis* a peculiar section, distinguished by their 5 leaves, and their cylindric pendulous squarrose cones; the leaves of *P. strobus* are the most slender, concave on the back, and strongly serrate; those of *P. strobiformis* are somewhat more rigid, convex on the back, and slightly serrate; those of *P. flexilis* are still more rigid, convex on the back, and entire.

[25] *Pinus macrophylla*, n. sp., squamis turionum longe acuminatis, fimbriato laceris, squarrosis, persistentibus; vaginis elongatis, adpressis, laceris; foliis ad apicem ramulorum congestis ternis, quaternis (rarius quinis) longissimis, margine carinaque serrulatis, utrumque aspero-striatis, subglaucis; strobilis ovato conicis; sqamis tuberculo conico, apice spinifero, recurvo instructis; seminibus parvis, alatis.

Common on the higher mountains of Cosihuiriachi; 70 to 80 feet high; sheaths 15 to 20 lines long; leaves 13 to 15 inches long in the specimens before me; in fours as well as in threes; rarely in fives; cone $4\frac{1}{2}$ inches long. Evidently near *P. australis*, Mich., but well distinguished by the characters enumerated.

[26] *Pinus Chihuahuana*, n. sp., squamis turionum acuminatis, adpressis; vaginis adpressis, elongatis, laceris, deciduis; foliis ternis (rare quaternis) supra glaucis, subtus virescentibus, leviter striatis, margine tenuissime serrulatis; strobilis ovatis, abbreviatis; squamis transverse ovatis, inermibus.

The common pine of the mountains of Chihuahua, at an elevation of about 7,000 feet; a tree of only 30 to 50 feet in height; leaves 2 to $3\frac{1}{2}$ inches long; serrulate on the margin, but with nearly smooth striae; cone in the specimen before me $1\frac{1}{2}$ inch long.

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A. sanguinea. These, together with a low scrubby oak tree, with small perennial leaves, were the only trees collected about Cosihuiriachi. A species of *Juniperus*, with red berries, a *Thuja*, and a small-leaved *Cowania* (?)[27] all of them in fruit, were also brought from there.

Between Chihuahua and Cosihuiriachi, but especially about the latter place, the porphyritic soil produced a number of *Cactaceae*, some strange *Echinocacti*, several *Mammillariae*, a few *Opuntiae*, and principally a great variety of *Echinocerei*. One of the latter is completely covered with stout and long spines;[28] another has short radiating spines, closely adpressed to the plant;[29] a third has short radiating spines, with single, stout black central ones, which project from the plant in all directions;[30] a fourth is distinguished by its longer and curved reddish radiating spines, with a stouter one projecting from their centre.[31] I have all of these in

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[27] *Cowania* sp. ? Shrubby; leaves crowded, small, cuneate three-toothed at apex, revolute, tomentose below, glabrous and glandular above, sweetscented; turbinate tube of calyx, as well as the oblong lobes, 1 line long; 25 stamens, persistent; about 5 woolly ovaries.—Compare below note 51.

[28] *Echinocereus polyacanthus*, n. sp., elongato-ovatus, 10-costatus; areolis elevatis, ovatis, subapproximatis, junioribus albido-tomentosis; aculeis radialibus 10-12 flavidis, apice adustis, plus minus porrectis; lateralibus majoribus, demum subadpressis, superioribus minoribus; centralibus sub-4 corneis, apice fuscis, 3 superioribus sursum versis, inferiore singulo longiore porrecto, demum deflexo.

Cosihuiriachi.—Several oval stems, 4 to 5 inches high and $2\frac{1}{2}$ to 3 in diameter, from one base; upper radial spines 4 to 5, lateral and inferior 8 to 10, upper central 9 to 12, lower one 15 to 20 lines long. Spines at last ashy-gray.

[29] *Echinocereus adustus*, n. sp., ovatus, 13–15-costatus; areolis elevatis, lanceolatis, approximatis, junioribus albo-tomentosis; aculeis radialibus 16–18 adpressis, albis, apice adustis; 4–5 superioribus brevibus, setaceis, lateralibus inferioribusque longioribus, robustioribus, centrali nullo.

Cosihuiriachi.—Plant $1\frac{1}{2}$ to 4 inches high, 1 to 2 in diameter; upper spines 1, lower about 2, and lateral 4 to 5 lines long.

[30] *Echinocereus radians*, n. sp., ovatus 13–14-costatus, areolis elevatis ovatis, subapproximatis, junioribus albo-villosis; aculeis radialibus 16-20 adpressis, junioribus apice adustis, superioribus brevibus setaceis, lateralibus inferioribusque longioribus robustioribus; centrali singulo porrecto, robusto, fusco.

Cosihuiriachi.—$2\frac{1}{2}$ inches high, 2 in diameter; upper radial spines 1 to 2, lower 3, lateral about 5 lines long; central spines brown or black, much stouter, 1 inch long.

[31] *Echinocereus rufispinus*, n. sp., elongato-ovatus, 11-costatus; areolis elevatis lanceolatis, approximatis, junioribus albido-villosis; aculeis radialibus 16–18, demum adpressis, intertextis; 3–5 superioribus setaceis, brevibus, albidis; lateralibus elongatis fuscis, recurvis, centrali singulo, robusto fusco, porrecto.

Cosihuiriachi.—Stem 4 inches high, below $2\frac{1}{2}$ in diameter; upper radia

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cultivation, but have not seen as yet flowers or fruit from any of them; still they cannot but belong to my genus *Echinocereus*, to judge from analogy.

Some *Mammillariae* of Cosihuiriachi are distinguished by their compact shape; the tubercles are very short, globose, or even hemispherical, the spines strong, numerous, radiating, and adpressed, the fruits central from a woolly vertex: *Mammillaria compacta.*[32] Another, *M. gummifera*,[33] belongs together with two species from Texas, and from the mouth of the Rio Grande to the section *Angulares*, with pyramidal 4 angled tubercles, and milky juice, which, hardening, forms a gum. A third species belongs to *Crinitae*, and is a most elegant little plant with numerous hairlike radiating and one stout, hooked central spine; I have named it *M. barbata.*[34]

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spines or bristles 1 to 2, lower about 4, and lateral 7 to 9 lines long; central spine much stouter, 1 inch long.

[32] *Mammillaria compacta*, n. sp., simplex, hemisphaerica, s. depresso-globosa; tuberculis abbreviatis, ovoideo-conicis, sulcatis; areolis ovato-lanceolatis, junioribus albo-tomentosis; aculeis omnibus radialibus, 13–16 subaequalibus, robastis, recurvatis, adpressis, intertextis, albidis, superioribus apice fuscis; sulcis tuberculorum axillisque junioribus et vertice tomentosis; floribus in vertice congestis; baccis ellipticis perigonio coronatis, viridibus; seminibus obovatis, laevibus, fulvis.

Cosihuiriachi.—Plant 2 to $3\frac{1}{2}$ inches in diameter and $1\frac{1}{4}$ to $2\frac{1}{2}$ inches high; tubercles in 13 rows, 4 lines high, 6 lines wide at base; spines interlocking, and thereby often deformed and twisted, stout, 7 to 10 lines long.

[33] *Mammillaria gummifera*, n. sp., lactiflua, simplex, hemisphaerica, tuberculis quadrangulato-pyramidatis; axillis areolisque junioribus albo-tomentosis; aculeis rectis, radialibus 10–12, inferioribus robustis, apice fuscis superiores setaceos albidos ter superantibus; centralibus 1–2 robustis, brevibus, fuscis, porrectis.

Cosihuiriachi.—From 3 to 5 inches in diameter, $2\frac{1}{2}$ to 4 inches high; when wounded it exudes a milky fluid, which, hardening, forms a transparent or whitish gum; tubercles mostly in 13 oblique rows, 6 to 7 lines long, and 5 to 6 lines wide at base; upper spines 2 to 3, lower 6 to 7, central about 2 lines long. Flowers and fruit not seen, but probably like those of two similar species, *M. applanata*, Engelm. ined., from the Pierdenales, in Texas, and *M. hemisphaerica*, Engelm. ined., from the mouth of the Rio Grande; both are also simple, lactescent, with pyramidal tubercles, and both have small reddish white flowers, and long clavate scarlet berries, without the remnants of the flower. It is a fact which I have repeatedly observed, and in a considerable number of species, that the red-globose, or clavate berries of the mammillariae are always destitute of the remnants of the perigon, etc.; but the oval green fruits always are topped with it.

[34] *Mammillaria barbata*, n. sp., simplex, globoso-depressa; tuberculorum axillis nudis; aculeis radialibus numerosissimis pluriserialibus, exterioribus piliformibus albis sub-40; interioribus paulo robustioribus fulvis 10–15, centrali singulo robusto, uncinato, fusco, erecto; baccis oblongis, viridibus, apice floris rudimento coronatis.

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The specimen communicated by Dr. Wislizenus, the only one found, was dead when it arrived here, but many fruits were adhering to the plant, and I was thus fortunate enough to cultivate it from the seeds.

Other remarkable cactaceae from the State of Chihuahua, which have been communicated to Dr. Wislizenus by Mr. Potts, of Chihuahua, are not described here, as it is believed that Mr. P. has sent them already to England, where, no doubt long before this, they have been published.

Amongst the other distinguished plants of Cosihuiriachi and Llanos, I cannot omit to mention a beautiful *Delphinium*,[35] which grew abundantly here; a *Silene*, which is perhaps new, but comes near to *S. multicaulis*, Nutt., of the Rocky mountains, and *S. Moçiniana*, DC of Mexico; a new *Bouvardia*,[36] which is remarkably distinct from all the other Mexican species of this genus by its smoothness; an *Echeveria* perhaps identical with the Californian *E. caespitosa*, DC.; several *Gerania*, which appear to be undescribed, one of them with white flowers; an *Eryngium*,[37] with

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Cosihuiriachi.—The only specimen seen was about 2 inches in diameter; tubercles 4 lines long; spines 3 to 4 lines in length; fruit 5 to 6 lines long, in a circle around the younger tubercles; seeds obovate scrobiculate, dark brown, minute.

[35] *Delphinium Wislizeni*, n. sp., perenne, erectum, simplex, glabrum; petiolis elongatis, infimis basi dilatatis; foliis pedatifide 5–7-partitis, laciniis incisis, segmentis linearibus, acutis, divaricatis; floribus laxe paniculato racemosis; bracteis subulatis; floribus longe pedicellatis; calcare subulato, curvato sepala paulo superante; sepalis 2 exterioribus acutis, 3 interioribus obtusissmis; petalis brevioribus acuminatis; ovariis glaberrimis.

On the Bufa, a porphyry rock near Cosihuiriachi, 8,000 feet high, in flower in September. Stem 2 to $2\frac{1}{2}$ feet high, slender, glabrous, glaucous; flowers sparse, with the spur $1\frac{1}{2}$ inch long, beautifully blue, on the outside slightly puberulent.

B. glaberrima + B. Kl. B. splendens Gr.

[36] *Bouvardia glaberrima*, n. sp., glaberrima, caule erecto terete; foliis ternatis, breviter petiolatis, ovatolanceolatis, utrinque acuminatis, patentibus s. reflexis; cyma composita, foliacea; calycis segmentis tubum bis superantibus; corolla calyce quintuplo s. sexuplo longiore, extus glabriuscula, intus parce barbata.

Cosihuiriachi, flowers September. Perennial; 2 feet high, leaves 3 to $3\frac{1}{2}$ inches long, 8 to 10 lines wide; flowers bright crimson, 12 to 15 lines long. Apparently one of the largest species of the genus; leaves entirely glabrous, not revolute on the margin.

[37] *Eryngium heterophyllum*, n. sp., glaberrimum, caule erecto; foliis radicalibus oblanceolato-linearibus, acutis, penni-nerviis, serratis, serraturis cartilagineo-marginatis, aristatis; foliis caulinis inferioribus serrato-pinnatifidis, superioribus palmati-partitis, segmentis linearibus incisis; foliis involucralibus 10–13 linearibus acuminatis, spinoso bidentatis, rarius integris, capitulum ovale longe superantibus; bracteis (coeruleis) subulatis flores superantibus, interioribus longioribus.

Common in valleys about Cosihuiriachi; flowers September. Biennial, $1\frac{1}{2}$ to 2 feet high; radical leaves 2 inches long, 2 lines wide; involucral leaves 12 to 15 lines long, 1 line wide; heads about 4 lines in diameter.

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the lowest leaves most elegantly pectinated, and the upper ones palmately divided; a *Zinnia*,[38] intermediate between *Zinnia multiflora* and *Z. elegans*, and which last season grew finely near St. Louis from seeds picked from these specimens. Many other *Compositae* have not yet been examined; a *Centaurea* may be found to be distinct from *C. Americana*, so far the only American species of that genus, which is so extensively diffused in the old world.

Leaving aside several *Daleae*, *Lupini*, *Giliae*, a *Gentiana*, *Buchnera*, *Castilleia*, a number of *Labiatae*, *Gramineae*, and many others, I will only mention a few more, which I had time to study more closely. First of all, the beautiful and delicate *Heuchera sanguinea*,[39] probably the most southern, and certainly the most ornamental species of that genus. Next in beauty comes the bright-flowered *Pentstemon coccineus*;[40] *Lobe-*

Near two other Mexican species, *E. Carlinae*, Lar., and *E. Haenkei*, Presl., distinguished from the first by the larger number of linear, not ovate serrate involucral leaves; from the other also by the larger number of those leaves which are generally toothed, not entire.

[38] *Zinnia intermedia*, n. sp., caule erecto, ramoso, parce adpresse piloso; foliis scabris, inferioribus ovatis, basi obtusis, superioribus subsessilibus ovato-cordatis, acutis; pedunculo apice vix incrassato; involucri ovati squamis marginatis obtusis; paleis cristato fimbriatis; radii ligulis oblanceolatis, extus scabriusculis, ciliatis; acheniis radii linearibus, disci 1-aristatis.

Common about Cosihuiriachi, flowers in September. Annual, 1 to 2 feet high; leaves 1 inch long, 6 to 8 lines wide; flowering heads 18 to 20 lines in diameter. The cultivated specimens grew 3 feet high; leaves 3 inches long and half as wide; heads hemispherical, larger, ligulae less acute. Differs from *Z. multiflora* by the less inflated peduncle, the broader and shorter leaves, the cristate paleae; from *Z. elegans*, to which the shape of the leaves and of the chaff much resembles, by the shape of the achenia. I may state here that in all the cultivated as well as native specimens of *Z. multiflora* the paleae are not entire, but fimbriate at the obtuse apex.

[39] *Heuchera sanguinea*, n. sp., petiolis patenti pilosis; foliis sinu latissimo cordatis, orbiculatis, 5–7-lobatis, lobis incisis duplicatim dentatis, ciliatis; junioribus pilosis; scapo nudo, infra parce piloso, supra cum pedicellis calycibusque colorato glanduloso; floribus laxe campanulatis; calycis lobis ovatis obtusis, subaequalibus; petalis lineari-spathulatis persistentibus, cum staminibus pistillisque inclusis.

Porphyry mountains of Llanos, flowers in September. Scape 8 to 12 inches high; upper part, together with the flowers, bright scarlet; enclosed petals inserted below the throat of the calyx; stamens still lower; filaments equal in length to the orbicular cordate red anthers.

[40] *Pentstemon coccineus*, n. sp., glaberrimus, glaucus, foliis infimis obovatis, caulinis inferioribus oblongo-linearibus, superioribus linearibus minutis; racemo laxo, pedicellis oppositis, elongatis, 2-bracteatis, 1-floris; calycis glandulosi segmentis ovatis; corollae tubo superne dilatato, limbo bilabiato, labio superiore ad medium bilobo; antheris divaricatis, filamento sterili glabro, apice dilatato; capsula acuminata.

Llanos, flowers in September and October. Stem 1 to 2 feet high, nearly

lia mucronata,[41] with fine red, and *L. pectinata*,[42] with blue flowers. Amongst the most curious plants collected here is also to be mentioned an *Eriogonum*,[43] with inflated clavate internodia, and dark red flowers. *Phaseolus bilobatus*,[44] is another interesting plant.

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naked above, pedicels filiform, lower ones much longer than the flower, which is 15 to 18 lines in length; bright scarlet or crimson. Next to *P. imberbis*, Steud., but easily distinguished.

[41] *Lobelia mucronata*, n. sp., perennis, caule simplici erecto, glabro, infra folioso, supra nudo; foliis lineari-lanceolatis, elongatis, acuminatis, argute denticulatis; floribus laxe spicatis; bracteis linearibus glanduloso-dentatis, inferioribus pedicellum superantibus, superioribus eum aequantibus; calycibus hemisphaericis et pedicellis hirtis; lobis calycis subulatis tubum duplo superantibus, tubum corollae dimidium aequantibus; lobis corollae superioribus lanceolatis, inferrioribus ovatis mucronatis.

Cosihuiriachi along rivulets; flowers in September. Stem 1 to 2 feet high; racemes short, few (3 to 12) flowered; color of flower darker red than in *L. cardinalis*, more like *L. fulgens;* distinguished from all similar ones by the short lobes of the calyx, and the ovate mucronate lower segments of the corolla.

I insert here the description of a nearly related species from the country below Monterey.

Lobelia phyllostachya, n. sp., glabra, caule erecto, folioso; foliis lanceolatis, acuminatis, irregulariter dentatis s. inferioribus subintegris; spica infra foliosa, elongata, densiflora; bracteis serrulatis, inferioribus florem longe superantibus, superioribus pedicello longioribus; calycis glabri laciniis subulatis corollam vix aequantibus s. ea brevioribus; laciniis corollae superioribus linearibus, inferioribus lanceolato-linearibus, acuminatis.

Swamps between Monterey and Cerralbo; flowers in May. Near *L. texensis*, Raf., but distinguished by its entire smoothness by the long (6 to 12 inches,) thick and foliaceous spike, and by the shorter segments of the calyx.

[42] *Lobelia pectinata*, n. sp., caule erecto, scabriusculo, folioso; foliis, bracteis et lobis calycinis pectinato-dentatis, scabris; foliis inferioribus oblongo-linearibus sessilibus, superioribus e basi lata cordata, decurrente angustatis; racemo elongato densifloro, bracteis florem subaequantibus; calycis tubo turbinato pedicellum aequante, lobis duplo breviore; tubo corollae brevi, lobis superioribus lanceolatis, inferioribus ovatis, ad medium coalitis; antheris styloque inclusis, 2 inferioribus apice barbatis.

Cosihuiriachi in moist places; flowers in September. Annual (?) 1 to 1½ foot high; leaves about 1 inch long; spike dense 4 to 6 inches long, blue flowers 6 lines long; tube with 3 slits about the middle.

[43] *Eriogonum atrorubens*, n. sp., perennis, foliis radicalibus petiolatis, lanceolatis, elongatis, villosis; caulis glabri glauci internodiis superne tumidis, clavatis; caule iteratim dichotomo, ad bifurcationes bracteis subulatis pilosis instructas involucrum alarem elongato-pedicellatum gerente; involucris campanulatis 5-dentatis, margine pilosis, multifloris.

Cosihuiriachi on the banks of streamlets, flowers in September. Perennial, 1½ to 2 feet high; leaves all radical, 5 to 6 inches long, 9 lines wide,

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In the following spring Dr. Wislizenus accompanied the Missouri volunteers, under Colonel Doniphan, from Chihuahua to Parras, Saltillo, Monterey, and Matamoros.

Zealous as ever, he again made large collections on this tour, but his duties as a military surgeon occupied his time rather more than the naturalist should have desired. Nevertheless his collections are very full. Fortunately Dr. Gregg accompanied the same expedition, and also made rich collections in that almost unknown region, which we may consider as the southwestern limits of the valley of the Rio Grande.

Before going into detail I will only remark here, what a reference to the map and sections will more fully present, that the country between Chihuahua and Parras has a general elevation of from 4,000 to 5,000 feet; between Parras and Saltillo it rises from 5,000 to 6,000 feet, and thence it rapidly descends towards the lower Rio Grande.

South of Chihuahua, a curious leafless *Euphorbia* was collected, with tuberous roots and leafless stem, nevertheless apparently a near relative of *E. cyathophora*. Here, for the first time, *Berberis trifoliata*, Moric., was met with, which appears to inhabit the whole middle and lower valley of the Rio Grande, as we find it again in this collection from Monterey, and Mr. Lindheimer has sent beautiful specimens from the Guadaloupe, in Texas.

Echinocerei and *Echinocacti* appear in greater abundance. The rediscovery of the beautiful *Echinocereus pectinatus* (*Echinocactus pectinatus*, Scheidw., *E. pectiniferus*, Lem., *Echinopsis pectinata*, Salm, in part) is peculiarly interesting, as it furnishes the means of proving a Texan species, which has been confounded with it, to be entirely distinct. The description of the plant, (which died without producing flowers,) found in several works, as well as in the latest publication on *Cactaceae*, before me, of *Foerster, Leipzig*, 1846, was made, as Prince Salm informed me, from specimens sent from Chihuahua by Mr. Potts; it entirely agrees with my specimen from the same region. But the description in Foerster's work of the *flower* of a specimen in Cassel, flowering in 1843, (not

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on shorter petioles; some of the lower joints about 6 lines in diameter, the upper ones much less tumid; pedicells 1 to 3, lowest even 4 inches long; involucrum about 1 line long and wide, always 5 toothed, including 25 to 30 deep red flowers; lobes about equal; nut olive green acuminate three winged. Singularly near *E. inflatum*, Torr. and Frem., perhaps too near to be specifically separated; but apparently distinct by the hairy leaves and bracts, the furcate division of the stem, the large number of flowers in each involucrum, and perhaps their purple color, (not mentioned by Torrey.)

[44] *Phaseolus bilobatus*, n. sp., caule prostrato, pilis retrosis hispido; foliolis adpresse pilosis reticulatis, lateralibus subsessilibus inaequaliter bilobatis, terminali petiolulato, lineari-oblongo; pedunculis folia longe superantibus multifloris; culycis hirsuti laciniis subulatis tubum aequantibus; leguminibus compressis, hirsutis, curvatis; seminibus laevibus.

Common about Cosihuiriachi, flowers in September. Resembles *Ph. leiospermus*, T. and Gr., but the brown-red flowers, and legumes much smaller; shape of the leaves very characteristic. Legume 9 lines long and 1 line wide, seed very small.

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known from where obtained,) shows *that* to be identical with a Texan species, common between the Brazos and Nueces rivers, which I have described in Engelmann and Gray's Plantae Linheimerianae, Boston Journal of Natural History, v, page 247, under the name of *Cereus caespitosus*, and which should now be named *Echinocereus caespitosus*. *Echinopsis pectinata*, β. *laevior*, Monv., and γ. *Reichenbachiana*, Salm, are perhaps forms of this Texan plant, which varies considerably in its native country. Dr. Wislizenus has sent me a living specimen and dried flowers of *E. pectinatus;* unfortunately the plant met with a similar fate to those sent to England by Mr. Potts, and there is none now in cultivation, if I am correctly informed; but I preserve the dried specimen in my herbarium, and have been enabled to draw up from it the description.[45]

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[45] *Echinocereus pectinatus* mihi, (*Echinocactus pectinatus*, Scheidw., *E. pectiniferus*, Lem.,) simplex (an semper?), ovato-cylindricus, 23 costatus; areolis elevatis, linearibus, approximatis, junioribus albo-villosis; aculeis radialibus 16–20 subrecurvis, adpressis, pectinatis, albis, apice roseis, superioribus inferioribusque brevioribus, lateralibus longioribus; centralibus 2–5 brevissimis, uniseriatis; tubo floris pulvillis 60–70 brevitomentosis aculeos albos s. apice roseos 12–15 gerentibus stipato; sepalis interioribus 18–20 oblanceolatis; petalis 16–18 oblongis, obtusis, erosodenticulatis, mucronatis.

Bachimpa, south of Chihuahua; flowers in April. Stem 7 inches high, below $3\frac{1}{2}$, above $2\frac{1}{2}$ inches in diameter; upper and lower spines 2 lines, lateral 4 lines long; central spines mostly 3, sometimes 2, and below as much as 5, in one vertical row, $\frac{1}{2}$ to 1 line in length. Flowers about 3 inches long and wide; red or purple, spiny bristles on the tube 2 to 3 lines long; the uppermost 3 to 5 lines long, only 3 to 5 together.

It will not be amiss to introduce here again a more complete and correct description of its Texan relative.

Echinocereus caespitosus mihi, (*Echinopsis pectinata*, authors in part; *Cereus caespitosus*, Engelm, l. c.,) ovatus, caespitosus, 13–18-costatus, areolis elevatis, linearibus, approximatis, junioribus albo-villosis; aculeis radialibus 20–30 subrecurvis adpressis, pectinatis, albis (nonnunquam ~~roseis~~, Lindh.,) superioribus inferioribusque brevioribus, lateralibus longioribus, centralibus nullis; tubo floris pulvillis 80–100 longe cinereovillosis setas apice s. totas fuscas s. nigricantes 6–12 gerentibus, stipato; sepalis interioribus 18–25 oblanceolatis integris s. denticulatis; petalis 30–40 obovato-lanceolatis, obtusis, acutis, s. mucronatis, ciliato-denticulatis; stigmate viridi infundibuliformi, 13–18-partito; bacca viridi ovata, perigonio coronata, villosa, setosa, demum nudata; seminibus obovatis tuberculatis, nigris.

From the Brazos to the Nueces, in Texas, Lindheimer; flowers in May and June; generally 1 to 2 inches high, and of nearly the same diameter; rarely as much as 5 or 6 inches high, and 2 to $3\frac{1}{2}$ inches in diameter; longer lateral spines in different specimens 2 to 4 lines long; flowers in the northern specimens, from Industry, 2 inches long and wide, in those from New Braunfels $2\frac{1}{2}$ to 3 inches in diameter and length; generally a little wider than long when fully open. Brown or black bristles on the tube 2 to 5 or 6 lines long, surrounded by wool, which is often 3 lines in length.

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Near San Pablo another *Echinocereus*[46] was found, and dried flowers as well as living specimens have safely arrived here. A large *Echinocactus*[47] was collected near Pelayo; unfortunately no flowers were seen; but the specimen brought to St. Louis is so far in fine condition. Of another smaller, but most elegant species of the same genus,[48] Dr. Wis-

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[46] *Echinocereus enneacanthus*, n. sp., ovato-cylindricus 10-costatus; areolis elevatis, orbiculatis, distantibus, junioribus breviter albo-tomentosis; aculeis angulatis, compressis, rectis, albis; radialibus 8 subaequalibus, centrali singulo longiore, demum deflexo; floris tubo pulvillis 30–35 albo-tomentosis setas spinescentes albidas fuscatasque inferioribus 6, superioribus 2–3 gerentibus stipato; sepalis interioribus 10–13 oblongo-linearibus, petalis 12–14 lineari-oblongis obtusis s. mucronatis, apice denticulatis; stigmatibus supra stamina brevia exsertis, 8–10 linearibus elongatis.

Near San Pablo, south of Chihuahua; flowers in April. Plant 5 to 6 inches high, 3 to 4 in diameter; branching from the base; areolae about 1 inch distant from one another, spines stout, angular, like those of *E. triglochidiatus*, lateral spines 9 to 16, central one 18 to 22 lines long. Flowers $2\frac{1}{2}$ to 3 inches long, red; spiny bristles in the axills of the lowest sepals (on the ovary) four brown 2 to 4 lines long, and two white 3 to 4 lines long; higher up the number of the brown bristles diminishes, and on the upper part of the tube we find only two white bristles of 6 lines length in the axills.

[47] *Echinocactus flexispinus*, n. sp., globosus, vertice subnudo, costis 13 obliquis, tuberculato subinterruptis; areolis ovatis, junioribus albo-tomentosis, distantibus; aculeis junioribus rubellis, demum cinereis; radialibus 9–11 rectis s. subflexuosis, superioribus tenuioribus, infimo breviori, curvato, lateralibus longioribus compressis annulatis, rectiusculis; centralibus 4 angulatis compressis annulatis, 3 superioribus rectiusculis s. curvatis, inferiore longissimo flexuoso, plerumque paulo uncinato, deflexo.

Pelayo, between Chihuahua and Parras. The specimen before me is 10 inches high, and the same in diameter; ribs thick but not rounded; areolae (without the floriferous areolae, which are 3 to 4 lines long,) 6 lines long and 4 wide, 1 or $1\frac{1}{2}$ inch distant; upper spines the most slender, $1\frac{1}{4}$ to $1\frac{1}{2}$ inch long; lowest one 1 to $1\frac{1}{4}$ inch long, stouter; lateral spines $1\frac{1}{2}$ to 3 inches in length, slightly, and sometimes indistinctly annulated; upper central spines $2\frac{1}{2}$ to 4 inches long; lower spine stoutest, 4 to 5 inches long, mostly deflexed, often flexuous and twisted, more curved or even hooked at the extremity, much compressed, 4-angled, sharply carinate above and below, slightly annulated.

[48] *Echinocactus unguispinus*, n. sp., depresso-globosus, costis 21 interruptis tuberculatis, areolis approximatis junioribus albo tomentosis; aculeis radialibus sub 21 tenuioribus, albidis, recurvis, intertextis, centralibus 5 (rarius 6) robustioribus, longioribus, corneis, sursum versis, singulo robustissimo, fusco deorsum flexo; floris ovario tuboque brevi sepalis membranaceis, auriculato-cordatis, fimbriatis stipato; petalis oblongis obtusis; stigmate brevissimo conico 10–15 sulcato, (s. partito?)

About Pelayo, flowers in May. A very elegant plant; the specimen

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lizenus collected the living plant and flowers, and Dr. Gregg the ripe fruit. It is distinct from the other *Echinocacti* found in those regions by the membranaceous very thin sepaloid scales on the tube of the flower and the juicy glabrous fruit, in which respect it resembles my *E. setispinus* from Texas; *E texensis*, Hpfr., has a juicy fruit, covered with woolly and spiny scales; *E. Wislizeni* and others have a dry fruit, covered with hard scales.

My *Opuntia frutescens* (Plant. Lindh. l. c. p. 245) which had been collected by Mr. Lindheimer along the Colorado and Guadaloupe rivers, in Texas, was also found south of Chihuahua by Dr. Wislizenus, and again along the route near Parras, and below Monterey. The suggestion made in the Plant. Lindh., that it may be a southern variety of *O. fragilis* o the Upper Missouri, has proved to be erroneous, as they belong to quite distinct sections of the genus *Opuntia; O. frutescens*, together with *O. vaginata*, (vide note 18,) is one of the *Opuntiae cylindraceae graciliores* and is apparently nearly related to *O. leptocaulis* DC., but is easily distinguished by its strong, white, single spines, while *O. lept.* has 3 shor blackish bristles.

Agave Americana, with several relatives, was found in abundance o this part of the route; *Argemone Mexicana*, white, yellow, or rosecolored was frequently met with; *Samolus ebracteatus* occurred in moist place so far inland, and on such elevations, while before it was only known a a litoral plant; *Malvaceae*, *Oenotherae*, *Asclepiadaceae*, *Giliae*, *Solaneae Justiciae*, shrubby *Labiatae*, were collected of many different species; bu the great characteristic of the country were the shrubs forming the ofte impenetrable thickets, called "chaparráls." They are mostly spinou

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before me 4 inches in diameter, 3 inches in height; the large recurve spines, especially the stoutest central one, which is of a bluish horncolo with a brown point, and is curved and bent downward like a large fan cover the whole surface of the plant, and give it a very pretty appearanc Lower radiating spines 6 to 10, upper 12 to 15 lines long; upper centr spines 12 to 18 lines long, but lower stouter one only 10 to 12 lines length. Flowers described from the shrivelled specimens found on t living plant; about 1 inch in length, and probably pale red. I have litt doubt that some fruits collected in the same region (about San Lorenz by Dr. Gregg belong to this species; the fleshy oval berry is 10 or lines long, covered with the same auriculate thin scales which we fi on the flowers, and crowned with the remnants of the flower; see black, much compressed, somewhat rough, albumen considerable, embr curved, cotyledons short obtuse. This is a very remarkable plant, a approaches in shape some *mammillariae;* the tubercles which form t interrupted ribs are sideways compressed, have a tomentose groove their upper edge, which ends in a regular axillary depressed areola, li that of a true *mammillaria;* but the scaly ovary and the curved embr prove it to be an *Echinocactus.* The specimen brought here by Dr. died soon after it arrived, as many of those collected in April and M during the flowering season, though only two months on the road, wh those collected the year before, between August and November, whi had been packed up for eight or ten months, mostly do very well nc Dr. Gregg's seeds, however, have germinated well.

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very much branched, often with remarkably small leaves, and not rarely with edible fruits. Among them many rhamnaceous and celastraceous shrubs, and some *Euphorbiaceae*, were particularly conspicuous, as well as some *Mimoseae*, one of which I must not forget to mention, because it is perhaps the smallest shrub in this family; not more than one or two inches high, with diminutive leaflets, but large purple flowers; it was collected near Chihuahua.

One of the most offensive of these chaparrál-shrubs was the *Koeberlinia*, Zucc., called here *Junco*, (Gregg.;) a small tree rather than a shrub, about 10 feet high, stem 4 to 6 inches in diameter; wood hard, dark brown with white alburnum; terminal branches green, with a dark brown spinous termination, 1 to 2 inches long, and $1\frac{1}{2}$ to 2 lines in diameter; very small subulate leaves soon deciduous; small white flowers in short lateral racemes; fruit not seen; in flower in May. It was frequently seen from south of Chihuahua to Monterey, (and Matamoros, Gregg.)

We find here again the interesting *Chilopsis* mentioned above, (see note 11,) also *Larrea glutinosa*, (note 10,) and another zygophyllaceous shrub, a true *Guajacum*,[49] which appears to be an undescribed species; it belongs to those plants that connect the Mexican with the Texan flora, as we find it extending from Parras to Monterey, and from there to the Upper Colorado, in Texas. *Tecoma stans* reappeared here with smaller pubescent leaves and more alate petiole, though probably not distinct from the larger and smoother plant found below Paso.

The beautiful *Fouquiera splendens*, (see note 16,) with its panicles of long tubular crimson flowers, rose here above all other shrubs; in some instances it reached a height of from 20 to 30 feet, and perhaps more, always in single stems.

A few species of *Yucca*, together with *Opuntia arborescens*, (note 5,) formed almost the only trees on the arid plains. But in the valley of the Nazas occur stately trees of a species of *Algarobia*, distinct from the *A. glandulosa* of the north, with broader legumes, larger seeds, and few or no glands on the leaves.

About Saltillo *Echinocactus texensis*, Hpfr., (*E. Lindheimeri*, Engelm., in Plant. Lindh. l. c.,) was found, which extends from here to Matamoros, and to the Guadaloupe and Colorado, in Texas. The pretty *Mammillaria strobiliformis*,[50] grows on rocks near Rinconada. *Hunne-*

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[49] *Guajacum angustifolium*, n. sp., foliis sub-5 (4–8) jugis glaberrimis, foliolis oblongo-linearibus, reticulatis; pedicellis et basi calycis pubescentibus; ovario bilobo, pubescente; capsula bivalvi, seminibus 2 ovatis.

About Parras; collected also by Dr. Gregg, who has found the plant common from Monclova to Parras, Monterey, and Camargo; found by Mr. Lindheimer on the Pierdenales river in Texas; flowers in April and May. Shrub or small tree with very knotty branches; leaflets mostly in 5 or 6 pairs, only on young vigorous shoots 6 to 8 pairs, mostly only 4 lines long, $\frac{1}{2}$ to 1 line wide, reticulated on both sides. Purple flowers 6 lines in diameter; seeds yellow, of the size of small beans. The hard and heavy yellowish brown wood is called "*Guajacan*" about Saltillo, and used as a sudorific and in venereal diseases, (Dr. Gregg.)

[50] *Mammillaria strobiliformis*, n. sp, simplex ovato-conica, tuberculis imbricato-adpressis, conicis, applanatis, sulcatis; aculeis rectis radialibus

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mannia fumariaefolia, Sweet, was collected near Saltillo, with smaller flowers, (1½ inch in diameter,) and near Rinconada, with larger ones, (3 inches in diameter;) an interesting plant, the eastern representative of the Californian *Eschscholtzia*, but perennial, with a small torus, a different stigma, etc.

I cannot omit to introduce here a beautiful shrub discovered on the rocks about Agua Nueva and Buena Vista by Dr. Gregg. Depending upon Don's characters of *Cowania* as correct, I must consider this plant as the type of a new genus, which I have great pleasure to dedicate to its indefatigable discoverer, my friend Dr. Josiah Gregg, whose name has already been frequently mentioned in these pages.[51] *Greggia rupestris* is a lovely, sweet-scented shrub, with flowers resembling roses in shape and color, so that Dr. Gregg was induced to name it the "Cliff rose."

North and northeast of Monterey we reach the lower country, and with it a different vegetation; here is the home of the shrubby *Cassieae* (*Parkinsonia*, *Casparea*, etc.,) and *Mimoseae*; *Sophora*, *Diospyros*, some species of *Rhus* and *Rhamnus* are common here, as well as a climbing yellow-flowered *Hiraea*, while another erect red-flowered species grows on the table-lands near Parras. One of the most beautiful shrubs of that district is *Leucophyllum texanum*, Benth., with its whitish tomentose leaves and sweetscented blue flowers. It is common from San Antonio, in Texas, to Monclova, and from Cerralbo to Camargo, but is not seen on the table-lands.

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sub-10 albidis, centralibus 3 fusco-atris, 2 minoribus sursum versis, singulo longiore porrecto; floribus in vertice lanato centralibus, ovario lanoso; sepalis sub-10 lanceolatis, acutis, integris; petalis sub-24 ovato-lanceolatis, mucronatis, integris vel versus apicem erosis; stigmatibus 7 flavis erecto-patentibus exsertis.

Rinconada, on rocks; flowers in June. About 3 inches high, and 2 inches in diameter below; tubercles in 10 to 13 oblique rows closely adpressed, so as to give the whole plant the appearance of a pineapple or cone, tomentose in the groove and the axills, about 6 lines long; radial spines 3 to 5, central 5 to 8 lines long; flowers central, 3 to 5 in a cluster together imbedded in long and dense wool, about 15 lines long and wide; petals deep purple.

[51] *Greggia*, n. gen., (*Greggia*, Gaertn. = *Eugenia*, Mich., fide Endlicher,) calyx tubulosus, 5-lobus, imbricatus; petala 5 calycis fauci inserta stamina numerosissima cum petalis inserta; ovaria plura fundo calycis inserta 1-rarius 2-ovulata; stylus villosus, deciduus, stigma nudum; ovulum supra basin ovarii placentae laterali insertum, anatropum; achenia villosa caudata; semen unicum erectum, embryo radicula infera.

A Mexican shrub with small cuneate truncate dentate leaves with adnate stipules, and solitary rose-colored or purple sweetscented flowers.

Greggia rupestris, n. sp., cliffs about Saltillo, Buena Vista, and Agua Nueva, flowers January to March; several feet high, much branched leaves about 6 lines long, and at the apex 3 lines wide, crowded revolute on the margin, glabrous above, tomentose beneath; flowers terminal on short branchlets 15 to 18 inches in diameter. Nearly related to *Cowania*, but distinguished by the imbricate, not valvate calyx, the red not yellow flowers, and the deciduous, not persistent style.

5–10 feet high, stem much branched at base for 1–3 inches in diameter, rare but in some locality covers 1000's of acres of / rocky soil

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Vitis bipinnata and *V. incisa*, well known in the southwestern parts of the United States and Texas, were also found here. Remarkable herbaceous plants were a *Nicotiana*, an *Orobanche* (on the seacoast,) an *Eustoma*, several *Asclepiadaceae*, *Malvaceae*, *Cucurbitaceae*, *Labiatae*, and others. *Lobelia phyllostachya* has already been mentioned above. (See note 41.)

Hasty and imperfect as this notice of the collections of Dr. Wislizenus is, it cannot but impress the botanist with the richness and novelty of the flora of these countries, and invite the arduous explorer to further exertions.

GEORGE ENGELMANN, *M. D.*

St. Louis, *December*, 1847.

Upon the authority of Professor John Torrey, of New York, who has done me the favor to look over the botanical manuscript of Dr. Engelmann before its going to press, I add here the following two corrections:

Larrea glutinosa (n. sp., No. 10) seems to be *Larrea Mexicana* of Moricaud, described and figured in a work to which Dr. E. had not access.

Geranium pentagynum (n. sp., No. 6) seems to be *Geranium Frémontii* (Torr.) of Frémont's second report.

A. W.

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THE METEOROLOGICAL TABLES

Are prepared from my meteorological journal, kept on the road. Some of the columns may require an explanation.

The column "*boiling point of water*," refers to my observations with two thermometers, constructed by my order, by J. W. Edmonds, of Boston, each varying from 85 to 100° Celsius, and every degree divided in tenths. I made many experiments with them on the road, to find the relative difference between the boiling point of water and the mercurial column of my barometer. From about 50 such observations, made within the range of from 23 to 29 inches of the barometer, I abstracted the general result, that 1 inch of my barometer at the temperature of 32° Fahr., was = 1°.04138 boiling point Therm. Cels., and 1° Th. C. = 0″.96026 of the barometer. But, at the same time, I have come to the conclusion, as others before me, that the determination by the boiling point of water can never in correctness equal the barometrical measurement. A difference in fuel, in water, in the size of the vessel, in draught of air, &c., is apt to produce such a discrepancy in the relative boiling point, that this method will answer well enough as a correlative proof of the barometer, and for heights, where several hundred feet, more or less, is not a matter of consideration, but that it will never be capable of supplying the place of the barometer.

The *dew-point*, found by excess of temperature of the dry over the wet bulb, is calculated according to "tables for the determination of the dew-point," given in the Encyclopœdia Britanica, and republished in the "Report to the Navy Department of the United States on American coals, by Professor Walter R. Johnson: Washington, 1844." Observations beyond the reach of these tables, I calculated according to the rule given by Professor Espy: "The dew-point, when it is not very low, may be nearly obtained by multiplying the difference between dry and wet bulb temperature with 103, dividing the result by the wet-bulb temperature, and subtracting the quotient from the dry-bulb temperature; the remainder will be the dew-point."

In the column "*wind*," the force of the wind is designated, as recommended by Professor Espy, by numbers from 0 to 6; 0 being a calm, 1 a very gentle breeze, 2 a gentle breeze, 3 a fresh wind, 4 a strong wind, 5 a storm, and 6 a hurricane.

The *clearness of the sky* is also marked in numbers from 0 to 10; 0 representing entire cloudiness, and 10 entire clearness.

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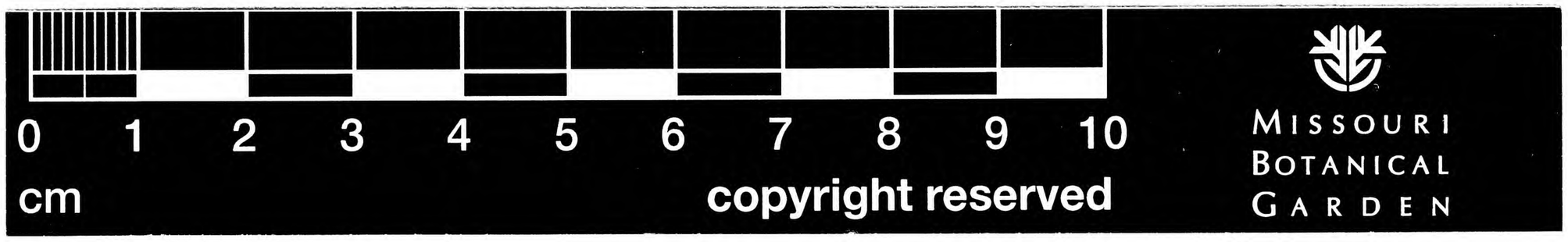
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